invention, the preferred methods and materials are described herein. All publications, patent applications, patents, and other references mentioned herein are incorporated by reference in their entirety. In addition, the materials, methods, and examples are illustrative only and are not intended to be limiting.

Other features and advantages of the invention will be apparent from the detailed description, and from the claims.

Brief Description of the Drawings

Fig. 1 is a depiction nucleotide sequence (SEQ ID NO:1) of human GLUTX.

Fig. 2 is a depiction of the predicted amino acid sequence (SEQ ID NO:2) of human GLUTX.

Fig. 3 is comparison of the amino acid sequences of GLUTX (SEQ ID NO:2), GLUT1 (SEQ ID NO:3), GLUT2 (SEQ ID NO:4), GLUT3 (SEQ ID NO:5), GLUT4 (SEQ ID NO:6), and GLUT5 (SEQ ID NO:7).

Fig. 4 includes a series of plots predicting various structural features of GLUTX: alpha regions (Garnier-Robson), beta regions (Garnier-Robson), turn regions (Garnier-Robson), coil regions (Garnier-Robson), amphipathic alpha regions (Eisenberg), amphipathic beta regions (Eisenberg), and flexible regions (Karplus-Schult). Fig. 4 also includes plots of antigenicity index (Jameson-Wolf), surface probability (Emini), and hydrophilicity (Kyte-Doolittle).

Detailed Description

GLUTX is a glucose transporter which has some sequence similarity to members of the GLUT family. GLUTX is predicted to have 12 transmembrane domains. The first

transmembrane domain extends from about amino acid 52 (intracellular end) to about amino acid 71 (extracellular end). The second transmembrane domain extends from about amino acid 108 (extracellular end) to about amino acid 128 (intracellular end). The third transmembrane domain extends from about amino acid 141 (intracellular end) to about amino acid 159 (extracellular end). The fourth transmembrane domain extends from about amino acid 166 (extracellular end) to about amino acid 189 (intracellular end). The fifth transmembrane domain extends from about amino acid 204 (intracellular end) to about amino acid 221 (extracellular end). The sixth transmembrane domain extends from about amino acid 233 (extracellular end) to about amino acid 252 (intracellular end). The seventh transmembrane domain extends from about amino acid 317 (intracellular end) to about amino acid 333 (extracellular end). The eighth transmembrane domain extends from about amino acid 355 (extracellular end) to about amino acid 375 (intracellular end). The ninth transmembrane domain extends from about amino acid 383 (intracellular end) to about amino acid 404 (extracellular end). The tenth transmembrane domain extends from about amino acid 413 (extracellular end) to about amino acid 437 (intracellular end). The eleventh transmembrane domain extends from about amino acid 449 (intracellular end) to about amino acid 472 (extracellular end). The twelfth transmembrane domain extends from about amino acid 481 (extracellular end) to about amino acid 499 (intracellular end).

The GLUTX gene was identified as follows. A variety of public and proprietary sequence databases were searched using an approach designed to identify putative glucose transporters. This search led to the identification of an EST which was thought likely to encode a portion of a gene

having some similarity to genes encoding previously identified glucose transporters. Two PCR primers (TGTTTCCTAGTCTTTGCTACA; SEQ ID NO:8 and TTGTTAAGGCCTTCCATT; SEQ ID NO:9) based on the sequence of the identified EST were used to screen a human mixed tissue cDNA library. This screening resulted in the identification of a probe which was used to screen the human mixed tissue cDNA library. This screening led to the identification of a number of putative glucose transporter clones. A number of these clones were sequenced and ordered to arrive at a complete sequence for GLUTX. The nucleotide sequence of GLUTX is shown in Fig. 1. The predicted amino acid sequence of GLUTX is shown in Fig. 2.

The nucleic acid molecules of the invention and the polypeptides they encode (*e.g.*, a GLUTX polypeptide or fragments thereof) can be used directly as diagnostic and therapeutic agents, or they can be used to generate antibodies or identify small molecules that, in turn, are clinically useful. In addition, GLUTX nucleic acid molecules can be used to identify the chromosomal location of GLUTX and as tissue-specific markers. Accordingly, expression vectors containing the nucleic acid molecules of the invention, cells transfected with these vectors, the polypeptides expressed by these cells, and antibodies generated, against either the entire polypeptide or an antigenic fragment thereof, are among the preferred embodiments. These embodiments and some of their clinical application are described further below.

I. Nucleic Acid Molecules Encoding GLUTX

The GLUTX nucleic acid molecules of the invention can be cDNA, genomic DNA, synthetic DNA, or RNA, and can be double-stranded or single-stranded. In the event the